THE FOLLOWING IS THE ENGLISH TRANSLATION OF THE ARTICLE 34 AMENDED SHEETS (Pages 24-27)

We claim:

1. A foam comprising at least 70% by weight of carbon and having a mean cell size above 20 µm, a porosity based on this cell size of from 35% to 99.5% and an open cell content above 90%, an internal surface area above 50 m^2/g, having cell struts whose cross section is a triangle having concave sides and having pores in the cell framework material having dimensions of from 0.2 nm to 50 nm and a volume of from 0.01 cm^3/g to 0.8 cm^3/g.

2. A foam as claimed in claim 1 which has a water content of less than 3% by mass and a nitrogen content above 0.01% by mass.

3. A foam as claimed in claim 1 or 2, wherein the framework material of the foam has a density of from 0.8 g/cm^3 to 2.3 g/cm^3.

4. A foam as claimed in any of claims 1 to 3, wherein the framework material of the foam has an electrical conductivity of from 10^{-10} S/cm to 5000 S/cm.

5. A foam as claimed in any of claims 1 to 4, wherein the framework material of the foam has a signal measured by means of solid-state ^{13}C nuclear magnetic resonance spectroscopy in the range from 100 ppm to 200 ppm which makes up more than 95 percent by area of the spectrum.

6. A foam as claimed in any of claims 1 to 5, wherein the framework material of the foam can be X-ray-crystalline or X-ray-amorphous.

7. A pulverulent carbon material obtained by mechanical comminution of a foam as claimed in any of claims 1 to 6.

8. A process for producing a foam comprising at least 70% by weight of carbon by pyrolysis of polymer foams which comprise at least 30% by mass of a polymer material having a nitrogen content of more than 6% by mass and having a porosity of from 35% to 99.5% and an open cell content above 1%, have inorganics incorporated into the polymer foam and/or applied to the surface and/or are treated during and/or after the pyrolysis with water vapor and/or carbon dioxide and/or oxygen at above 400°C.

9. A process as claimed in claim 8, wherein the polymer foams used are or comprise urea-formaldehyde resins.

10. A process as claimed in claim 8, wherein the polymer foams used are or comprise melamine-formaldehyde resins.

11. A process as claimed in claim 8, wherein the polymer foams used are or comprise polymeric isocyanate adducts.

12. A process as claimed in claim 8 or 11, wherein the polymeric isocyanate adducts used contain polyisocyanurate structures which have a ratio A_r of the absorbance of the isocyanurate band in the middle infrared region at about 1410 cm^{-1} recorded using the pressed potassium bromide pellet technique after preparation to the absorbance of the aromatic bands at about 1600 cm^{-1} of greater than 1.5.

13. A process as claimed in any of claims 8 or 11 to 12, wherein the polymeric isocyanate adducts used are prepared by reacting polyisocyanates with themselves, with compounds containing hydrogen-active groups or with further compounds which react with isocyanate in the presence of catalysts, stabilizers, blowing agents and, if desired, further auxiliaries.

14. A process as claimed in any of claims 8 or 11 to 13, wherein hydroxyl-containing polymerization products having a molar mass of greater than 200 g/mol und a functionality of greater than 1 are used as compounds containing hydrogen-active groups.

15. A process as claimed in any of claims 8 or 11 to 14, wherein polyesterols based on aromatic polycarboxylic acids and polyfunctional alcohols are used as compounds containing hydrogen-active groups.

16. A process as claimed in any of claims 8 or 11 to 15, wherein the further compounds which react with isocyanate contain organic acid anhydride structures.

17. A process as claimed in any of claims 8 or 11 to 14, wherein the further compounds which react with isocyanate contain epoxide structures.

18. A process as claimed in any of claims 8 or 11 to 17, wherein at least one compound having a crown ether structure is used as catalyst.

19. A process as claimed in any of claims 8 to 18, wherein as yet uncured phenolic resin components are employed in addition to the polymer foams used.

20. A process as claimed in any of claims 8 to 19, wherein inorganic salts, metal powders or expanded graphite are used as fillers in the preparation of the polymer foams used in an amount of from 0.1% by mass to 60% by mass, based on the total mass of the polymer foams.

21. A process as claimed in any of claims 8 to 20, wherein the polymer foams used are impregnated with solutions or dispersions of inorganic salts, metal powders or expanded graphite in water or organic solvents in such a way that an amount of from 0.1% by mass to 60% by mass of the inorganics remains on the foam after evaporation of the solvent.

22. A process as claimed in any of claims 8 to 21, wherein the inorganic salts used are zinc chloride and/or calcium carbonate and/or ammonium polyphosphate.

23. A process as claimed in any of claims 8 to 22, wherein the pyrolysis of the polymer foams is carried out by heating from room temperature to over 500°C and above 500°C to a temperature of 3000°C.

24. A process as claimed in any of claims 8 to 23, wherein heating is carried out at heating rates of from 0.05 K/min to 10 K/min during the pyrolysis.

25. A process as claimed in any of claims 8 to 24, wherein the pyrolysis of the polymer foams is carried out in an atmosphere of nitrogen and/or noble gases.

26. A process as claimed in any of claims 8 to 25, wherein the pyrolysis of the polymer foams is carried out by heating from room temperature to a temperature in the range from 400°C to 1200°C in nitrogen and/or noble gas and at higher temperatures in a mixture of water vapor with nitrogen and/or noble gas containing from 0.5% by volume to 80% by volume of water vapor.

27. A process as claimed in any of claims 8 to 25, wherein the pyrolysis of the polymer foams is carried out by heating from room temperature to a temperature in the range from 400°C to 1500°C in nitrogen and/or noble gas and at higher temperatures in a mixture of carbon dioxide and nitrogen and/or noble gas containing over 1% by volume of carbon dioxide.

28. A process as claimed in any of claims 8 to 25, wherein the pyrolysis of the polymer foams is carried out by heating from room temperature to a temperature in the range from 400°C to 1500°C in nitrogen and/or noble gas and at higher temperatures in carbon dioxide.

29. A process as claimed in any of claims 8 to 25, wherein the foam comprising at least 70% by weight of carbon is firstly produced by pyrolysis in nitrogen and/or noble gas and is subsequently treated at above 500°C with a mixture of water vapor and nitrogen and/or noble gas containing from 1% by volume to 80% by volume of water vapor.

30. A process as claimed in any of claims 8 to 25, wherein the foam comprising at least 70% by weight of carbon is firstly produced by pyrolysis in nitrogen and/or noble gas and is subsequently treated at above 500°C with a mixture of carbon dioxide and nitrogen and/or noble gas containing over 1% by volume of carbon dioxide.

31. A process as claimed in any of claims 8 to 25, wherein the foam comprising at least 70% by weight of carbon is firstly produced by pyrolysis in nitrogen and/or noble gas and is subsequently treated at above 500°C with carbon dioxide.

32. A process as claimed in any of claims 8 to 31, wherein the pyrolysis of the polymer foams is carried out in the temperature range from room temperature to 1500°C in the presence of oxygen in an amount of from 0.05% by volume to 30% by volume, based on the total amount of gas.

33. A process as claimed in any of claims 8 to 32, wherein the flow rate of the gas streams during the pyrolysis or the after-treatment of the foam comprising at least 70% by weight of carbon is from 0.01 liter per hour to 10 liters per minute and gram of foam.

34. The use of a foam as claimed in any of claims 1 to 6 for electrical and electrochemical applications, as filter and thermal insulation material, as support and storage material and as starting material for further reactions.

35. The use of a foam as claimed in any of claims 1 to 6 or of a pulverulent material obtained from such a foam as claimed in claim 7 as electrode material for supercapacitors and/or in fuel cells.